

CRS Report for Congress

The European Union's Energy Security Challenges

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Summary

Recent increases in energy prices and a steady escalation in global energy demand — expected to rise by nearly 60% over the next 20 years — have led U.S. policy-makers to engage in a wide ranging debate over how best to address the country's future energy requirements. Similarly, energy security has become a policy priority for the European Union (EU) and its 27 member states.

Together, the United States and Europe represent the world's largest energy market. Although they produce approximately 23% of the world's energy, they consume almost 40% of the world's supply. The member states of the EU account for approximately 18% of global oil consumption and consume 19% of gas produced.

Today, the EU imports about 50% of its energy needs. Barring significant changes, the European Commission (Commission) expects this figure to rise to 65% by 2030. Approximately half of the EU's imported energy in the form of oil and natural gas comes from Russia. Europe's growing dependence on Russian energy has fueled speculation that Moscow will use the "energy weapon" to try to influence future foreign or economic policy in Europe.

In March 2006, the European Commission released a "Green Paper" detailing the continent's energy challenges and outlining broad policy options for a comprehensive EU-wide energy security strategy. In a January 2007 follow-up to the Green Paper, the Commission unveiled a series of more specific policy actions that it is expected to officially recommend to EU member states at the European Council summit in March 2007.

The United States and Europe have steadily increased the transatlantic energy dialogue on issues such as collective energy security, energy efficiency and alternative energy sources. Leaders on both sides of the Atlantic have expressed a desire to increase U.S.-EU cooperation in the world energy market (for example, in the area of liquified natural gas) and on forging coordinated policies with regard to Russia and politically unstable regions that are home to substantial energy supplies.

As uncertainties surrounding global energy supply and demand persist, energy security issues are likely to gain importance in the 110th Congress. Members of the Democratic Leadership have signaled their intention to introduce legislation aimed at increasing energy independence and energy security and reducing carbon emissions. Several legislative proposals currently under consideration envision carbon emission trading schemes similar to those used in Europe today.

This report examines some of Europe's critical energy challenges and EU efforts to coordinate a common European energy strategy. It also includes an overview of broader transatlantic energy security cooperation. This report will be updated as needed. For additional information, see CRS Report RS22378, *Russia's Cutoff of Natural Gas to Ukraine: Context and Implications*, by Jim Nichol, Steven Woehrel, and Bernard Gelb and CRS Report RS22409, *NATO and Energy Security*, by Paul Gallis.

Contents

Introduction	1
The Context of Europe’s Energy Security Debate	3
Background	3
Turning Point	4
European Energy Consumption: By the Numbers	6
The European Commission Response	7
Commission Proposals	8
The “Green Paper”	8
An Energy Policy for Europe	8
Challenge 1: An External Policy for Energy Security	9
Russia	10
Caspian Region/Black Sea	14
Middle East/North Africa	17
Norway	19
External Strategy Conclusion	20
Challenge 2: Promoting Indigenous Energy Supply	20
Nuclear	22
Coal	22
Renewable Energy	23
Challenge 3: Providing Energy Security through An Internal Energy Market	24
Energy Interconnection	25
Storage	26
TEN-E Program	26
Assessment	27
Energy Security In The Transatlantic Context	28

List of Figures

Figure 1. EU Energy Consumption	6
Figure 2. EU Electricity Generation	21

List of Tables

Table 1. Imported Gas and Gas from Russia	7
-------------------------------------------------	---

The European Union's Energy Security Challenges

Introduction

Although the European Union's (EU) 27 member states have ceded some sovereignty (or competency) to the EU's institutional structure, energy policy remains primarily the responsibility of the member states. Decisions regarding long-term oil or gas purchases, the development and improvement of energy-related infrastructure, the use of particular energy fuels or the development of alternative fuels and technologies continue to be taken by individual member states.

Despite the lack of a common European energy policy, the European Commission has used its authority to pursue internal market competition and environment and consumer protection policies to increase its influence over member states' energy policies. However, most observers consider the continued preference of individual member states to make energy-related decisions without consulting with or assessing the impacts on other member states to be a severe impediment to the Commission's efforts to coordinate common goals and approaches for the Union as a whole. This is particularly true in the areas of gas and electricity market reform and in external relations with energy producing countries. Member state tendencies to exercise unilateral authority in these areas and growing concern that a lack of coordination is increasing the risks posed by Europe's energy dependence have spurred debate within Europe over whether the EU should assume more authority in developing and implementing a common European approach to energy policy.

The proposed Treaty on a European Constitution would elevate energy policy to a "shared" competency, meaning that although the EU could not unilaterally implement energy policy, it could exert more influence than it currently does over a broader array of decision-making. The Constitution has yet to be ratified by all EU members, and most observers agree it is unlikely that it will be passed in its current form. However, EU member states have demonstrated an increasing willingness to discuss energy policy at the European level and are expected to focus on the issue at an EU summit in March 2007.

Europe's renewed interest in energy security has been influenced by both internal and external factors. Steadily rising energy prices, declining European energy production and a fragmented internal energy market have contributed to anxieties over Europe's ability to meet future energy demand. The strain on global demand exerted by the emerging economies of countries such as China and India, persistent instability in energy producing regions, the threat of terrorist strikes against energy infrastructure, and Russia's apparent willingness to use its energy power for

political ends, are all raising concerns in Europe over how to address external influences that could affect future energy requirements.¹

Collectively, EU member states import half of their energy needs. Barring significant policy changes, this figure is expected to rise to 65% by 2030.² Today, oil, natural gas, and coal account for 80% of the energy consumed in the EU.

Europe's energy imports come primarily from Russia and the Middle East, where approximately 70% of global oil and gas supplies originate. Yet, the Middle East region is fraught with war, terrorism and politically unstable regimes. Iraq's oil production has not reached pre-war levels, and there is fear that terrorist groups could target pipelines and production facilities throughout the region. Iran has threatened to cut back oil production if forced to abandon its nuclear power program. With regard to Russia, recent political and economic behavior exhibited by Moscow has raised the dual specter of reliability and "energy politics."

High demand has also raised questions regarding the future availability of global oil and gas reserves. Although significant shortages are not projected for the next several decades, uncertainties over future exploration and production in areas such as Russia and the Middle East have raised concerns about long-term supply availability. The International Energy Agency (IEA) estimates that close to \$16 trillion in new investments may be needed over the next 30 years to meet future global energy demand.³

All of these issues have led Europeans to begin to plan more seriously for their energy future and to make energy policy a higher priority within the European Union.

The 109th Congress took an interest in U.S.-European relations with respect to energy security issues by holding several hearings on the subject and addressing the issue in a variety of transatlantic parliamentary forums.⁴ As uncertainties surrounding global energy supply and demand persist, issues pertaining to U.S., European and global energy security are likely to gain importance in the 110th Congress. Senator Richard Lugar, former Chairman and current Ranking Member of the Senate Committee on Foreign Relations, raised the possibility of a more

¹ Jos Van Gennip, *Energy Security*, NATO Parliamentary Assembly paper, 2006.

² See *Energy Overview*, Council of the European Commission, June 2006; *An Energy Policy for Europe*, Communication From the Commission to the European Council and the European Parliament. COM(2007) 1. Jan. 10, 2007.

³ See International Energy Agency (IEA), *World Energy Investment Outlook*, 2005.

⁴ In May 2006, Subcommittees of the House Government Reform Committee held a joint hearing entitled "Russian Energy Policy and Its Challenges to Western Policymakers." In late June, the Senate Foreign Relations Committee held a hearing on the "Future of Russia" in which energy policy was extensively discussed. Finally, in July 2006, the Middle East and Central Asia Subcommittee of the House International Relations Committee held a hearing entitled "Energy and Security Issues in Central Asia." Each of these hearings touched on Europe's energy challenges. In addition, the NATO Parliamentary Assembly and the Transatlantic Legislators' Dialogue has kept the issue of energy security and U.S.-EU cooperation on the agenda.

proactive role for NATO in energy security matters at NATO's summit in Riga, Latvia in November 2006. Members of the Democratic Leadership in the 110th Congress have signaled their intention to introduce legislation aimed at increasing energy independence and energy security and reducing carbon emissions. Several legislative proposals currently under consideration envision carbon trading schemes similar to those currently in use in Europe.

The Context of Europe's Energy Security Debate

Background

European concern regarding the security of its energy supplies was first prompted by the Arab oil embargo of the early 1970s. Specifically, the embargo highlighted three main issues. First, it exposed a need for increased collaboration among European countries and between Europe and the energy producing world with regard to energy policy. Second, it became clear that mechanisms for increased coordination in the event of future supply disruptions were essential. Third, consensus emerged that Europe should prepare strategies intended to prevent it from becoming the victim of future attempts by exporting nations to use energy as a political or economic weapon.⁵ The 1974 creation of the International Energy Agency (IEA), which has become Europe's primary instrument for monitoring and analyzing world energy markets, was one response to the embargo. In addition, European countries sought to develop strategies to diversify energy supply.

After the embargo, European countries began to identify Russia and other Eurasian countries as potential energy suppliers. At the time, Soviet Russia was beginning to realize its energy producing potential but required major investments in its energy sector. The prospect of future cooperation in the energy field began to play a key role in European perspectives on developing relations with Soviet Russia.

In 1991, the European Union launched the Energy Charter Declaration, an initiative intended to promote energy cooperation and diversify Europe's energy supply.⁶ The Declaration gave way to the 1994 Energy Charter Treaty that entered into legal force in 1998 and established a framework of rules and agreements to promote international energy cooperation. To date, 51 countries and the EU have signed or acceded to the Treaty.⁷ The Treaty seeks to create a level playing field of rules regarding the promotion of foreign energy investments; free trade in energy materials, products and equipment; freedom of energy transit through pipelines and

⁵ Daniel Yergin, "Ensuring Energy Security," *Foreign Affairs*, March/April 2006.

⁶ For more detailed information on the Treaty see *An Introduction to the Energy Charter Treaty*. The Energy Charter Organization. At [<http://www.encharter.org>]. Accessed Jan. 18, 2007.

⁷ Although the United States signed the 1991 Energy Charter Declaration, it has not signed the Energy Charter Treaty, so it retains the status of observer to the Charter process. U.S. officials have cited a preference to pursue energy-related matters on a bilateral basis.

grids; promoting energy efficiency; and providing mechanisms for addressing disputes.⁸

Since the signing of the Energy Charter Treaty, the European Commission has used its existing competency in competition and environment and consumer protection policy to attempt to shape a European energy policy in a variety of ways. These include promoting an internal gas and electricity market, encouraging the development of alternative energy supplies, and, in cooperation with the office of the High Representative for Common Foreign and Security Policy, pursuing a more cooperative approach to external relations with current and future energy suppliers.

Turning Point

Despite the aforementioned initiatives to integrate European energy security policy, member states continue to retain primary policy-making authority. However, a 2005 German-Russian gas pipeline agreement and more recent Russian manipulation of gas and oil flows to the European market have sparked a newfound sense of urgency among European leaders regarding the need for a more coordinated strategy.

In 2005, Germany and Russia agreed to build a gas pipeline connecting the countries under the Baltic Sea. While Germany maintains that the pipeline will represent a significant enhancement of German and therefore European energy supply and security, EU member states Poland and Lithuania have protested the decision. They counter that by running the pipeline under sea so it bypasses both countries and failing to coordinate with EU neighbors when negotiating with Russia, Germany's actions pose a threat to their and broader European energy security.⁹ Furthermore, prominent Swedish officials have voiced concerns that the pipeline will provide Russia with a platform to increase both military surveillance and its military presence in the strategically important Baltic Sea.¹⁰ The German-Russian agreement and subsequent responses from Poland, Lithuania, and more recently, Sweden, have reignited calls for a more coordinated European energy strategy.

As internal strife over the German pipeline decision continues, disputes between Russia and Ukraine and Russia and Belarus have heightened the call for more EU-wide coordination. In late 2005, Russia notified the Ukrainian government of a significant price increase in natural gas flowing to Ukraine. Officials in Kiev protested and accused Russia of attempting to destabilize the pro-western government of President Viktor Yushchenko. Though the price dispute did not directly involve Europe, the December 31, 2005, decision by Russia's gas monopoly, Gazprom, to temporarily suspend Ukraine's gas supply also interrupted supply to European countries. Within hours of the gas shut off, several countries in Europe including Austria, Italy, Poland, Slovakia and Germany, reported drops in their own

⁸ *An Introduction to the Energy Charter Treaty, Op. Cit.*

⁹ "Polish Press Slams Germany's Schroeder over Gas Pipeline Deal," *Agence France-Presse*, Dec. 12, 2005.

¹⁰ "Sweden Afraid of Russian Spooks," *Spiegel Online*. Nov. 15, 2006.

pipeline pressure by as much as 30%.¹¹ The gas crisis lasted only a few days, and after Russia and Ukraine reached an agreement on gas prices, gas was flowing again.

An almost identical dispute between Russia and Belarus with similar consequences for European countries, particularly Germany, occurred in early January 2007. This time, the Russian oil pipeline operator Transneft shut down its Druzhba oil pipeline that crosses Belarus and through which Germany receives 20% of its oil imports. Germany and the EU sharply rebuked Russia's decision, and Russia resumed oil delivery after three days of price negotiations with Belarus.

The Russia-Ukraine and Russia-Belarus gas and oil crises have been characterized by many European observers as “wake up” calls exposing Europe's energy security vulnerability even to unintended supply disruptions. More importantly, however, the crises raised the dual questions of Russia's reliability as an energy partner and Moscow's willingness to use its energy power as a political weapon. In an article assessing the Russia-Ukraine gas crisis, Jonathan Stern asks “what security lessons should Europe take away from the crisis...,” and answers by saying, “it is not wise for any country or region to become overly dependent on a single supplier or supply route... and that even disputes which do not directly involve third countries can affect those countries in the event of a problem between a supplier and a customer which is also a transit country.”¹²

In response, European leaders have called for concerted action on EU energy policy, particularly with regard to supply security. Germany, which holds the rotating EU presidency for the first half of 2007, has made the quest for a more cohesive policy a priority of its half-year presidency, and energy will be the focus of the EU's March Summit. However, rather than spur a complete rethinking of European energy policy, the increased political attention has brought a higher profile to existing Commission initiatives and proposals, which had previously received limited political backing. Even before the Russia-Ukraine crisis made front-page headlines, EU Energy Commissioner Andris Piebalgs in October 2005 stated that he felt it was time for Europe to “undertake a major review of European energy policy...” to determine if “... current policies correctly balance the EU's core objectives of competitiveness, security of supply and sustainable development.”¹³ It was at this forum that Piebalgs announced the Commission's intention to write a “Green Paper” addressing these issues.

¹¹ See “Q&A: Ukraine Gas Row,” *BBC News*, January 4, 2006; and CRS Report RS22378, *Russia's Cutoff of Natural Gas to Ukraine: Context and Implications*, by Jim Nichol, Steven Woehrel, and Bernard A. Gelb.

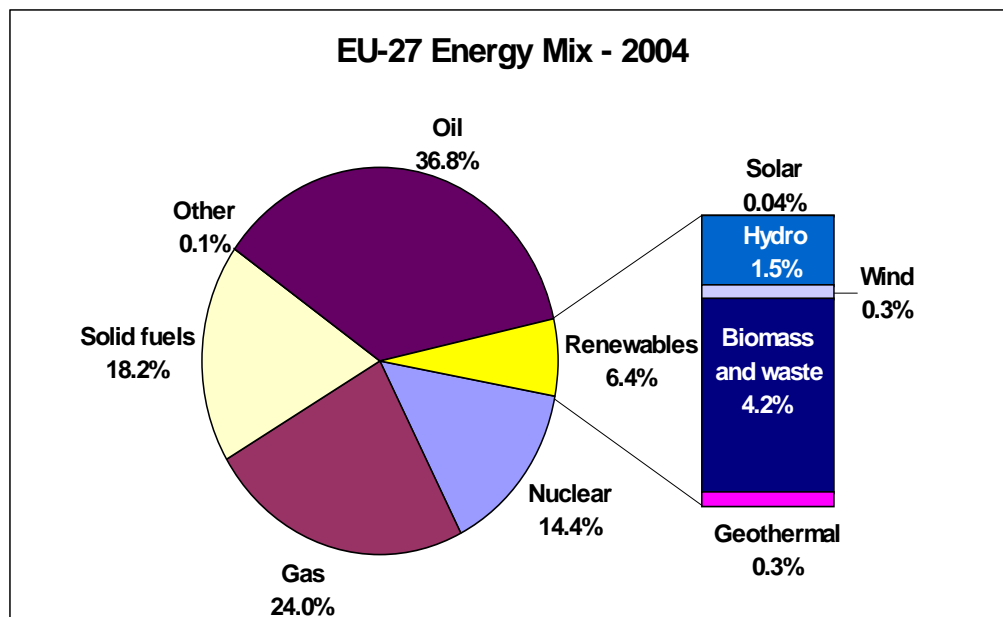
¹² Jonathan Stern, “The Russian-Ukrainian Gas Crisis of January 2006,” Oxford Institute for Energy Studies, January 2006.

¹³ Andris Piebalgs, speech before the European Fossil Fuels Forum, Oct. 19, 2005.

European Energy Consumption: By the Numbers

The EU's 27 member states account for approximately 17% of the world's total energy consumption.¹⁴ In 2005, about 80% of the energy consumed within the EU was from fossil fuels. The following chart provides an overview of the EU's energy consumption by fuel source.

Figure 1. EU Energy Consumption



Source: European Commission DG TREN, Eurostat; Commission Staff Working Document SEC(2007)12

According to the European Commission, EU member states import approximately half of their oil and gas supplies. If current trends continue, import dependence could rise to 65% by 2030.¹⁵ Russia, Norway, the Middle East, and North Africa are the largest suppliers of EU energy. In 2004, Russia accounted for 26% of the EU's oil imports and 29% of natural gas imports.¹⁶

Forecasters predict that natural gas consumption in the EU will double over the next 25 years, and gas has rapidly become Europe's fuel of choice for power generation. European natural gas consumption currently represents 17% of world consumption. Today, EU member states and Norway account for just over half of the EU's natural gas supply. The other half is imported primarily from the Russian Federation (29%) and Algeria (13%). European gas imports are expected to reach

¹⁴ Country Analysis Briefs: *European Union*, Energy Information Administration, January 2006.

¹⁵ "An Energy Policy for Europe," *Op. Cit.*

¹⁶ "EU Energy Policy Data," European Commission Staff Working Document, Jan. 10, 2007. Commission Document SEC(2007)12.

slightly over 80% by 2030.¹⁷ Several EU member states are totally dependent on Russian natural gas for their domestic energy consumption. The following chart illustrates the levels of dependency on Russian natural gas in selected nations of the EU.

Table 1. Imported Gas and Gas from Russia

Country	Dependence on Imported Gas, 2005	Total Gas Consumed, Imported from Russia
Austria	88%	74%
Czech Republic	98%	70%
Estonia	100%	100%
France	98%	26%
Finland	100%	100%
Germany	81%	39%
Italy	85%	30%
Poland	70%	50%

Source: International Energy Agency; Eurostat; British Petroleum.

The EU's increasing dependence on energy imports, especially with respect to Russian natural gas, has raised serious questions regarding its long-term security of supply, the need to diversify Europe's sources of supply, and the requirement that the EU develop both a broad common internal energy policy and an external energy strategy to deal with Russia and other regions of the world where Europe may turn for future energy supplies.

The European Commission Response¹⁸

Events surrounding the Russia-Ukraine and recent Russia-Belarus oil and gas crises have brought heightened public and political attention to Europe's growing energy dependence and the vulnerability of its energy supplies to external political events. In 2006, the European Commission revived its calls for a more cohesive European energy strategy, bringing energy security to the forefront of Europe's anticipated energy policy debate. In February 2006, Jose Manuel Barroso, President of the European Commission, speaking at Georgetown University stated: "there are few greater geopolitical challenges confronting us today than energy...we can no longer take secure and affordable energy supplies for granted...global energy demand

¹⁷ *Ibid.*

¹⁸ The European Commission is the EU's executive and holds the sole right of legislative initiative. However, in many policy-making areas, the Commission remains primarily an administrative body serving the representatives of national governments, which make up the EU's main decision-making body, the Council of Ministers. For more information see CRS Report RS21372, *The European Union: Questions and Answers*, by Kristin Archick.

is rapidly increasing...so it is uncertain how future demand will be met, and at what cost to our economies and the environment.”¹⁹

Commission Proposals

The “Green Paper.” In March 2006, the European Commission released an outline for a comprehensive European energy strategy in the form of a so-called “Green Paper” entitled, “A European Strategy for Sustainable, Competitive and Secure Energy.”²⁰ The paper called on member states to complete the process of opening their energy markets, dismantle protectionist policies, and create a single European electricity and gas market by mid-2007. Other priorities included measures to encourage an efficient “mix” of energy fuels to foster an integrated approach to climate change, to develop new energy efficient technologies, and to create a coherent external energy policy, especially regarding Russia. During their March 2006 European Council meeting, EU heads of state gave qualified support to the Green Paper, calling for a prioritized Action Plan to be adopted at its 2007 spring meeting.

An Energy Policy for Europe. In early January 2007, responding to the call for an EU Action Plan, the Commission released a series of specific policy proposals designed to meet the broader objectives outlined in the 2006 Green Paper.²¹ The January recommendations focus on the three interconnected goals previously endorsed by European leaders: increasing energy security; enhancing sustainability; and fostering competition in Europe’s internal energy market. The Commission places particular emphasis on the link between energy security and an EU-wide reduction in carbon emissions. European heads of state are expected to consider the Commission’s most recent proposals at their March 2007 EU summit.

In the area of security, the January 2007 policy recommendations urge member states to further incorporate energy supply objectives into an enhanced European foreign policy. Specifically, the Commission highlights the need to strengthen existing and seek further multilateral energy agreements, including a post-Kyoto Protocol carbon emissions framework, a bolstered Energy Charter Treaty, the internationalization of a carbon emissions trading scheme currently in practice within the EU, and increased promotion of renewable energy technologies. In an effort to diversify supply, the Commission calls on member states to enhance dialogue with key energy producer and transit countries, singling out Central Asia, Caspian Sea sources, and the Black Sea area. In addition, it calls for the formation of a European energy dialogue with African countries of strategic importance. With regards to Russia, the proposed energy policy highlights the need to institutionalize a common commitment to market principles enshrined in the Energy Charter Treaty and the

¹⁹ “Speaking with a Common Voice: Energy Policy for the 21st Century,” Jose Manuel Barroso, Georgetown University, Feb. 9, 2006.

²⁰ See EU Energy Directorate General at [<http://www.ec.europa.eu/energy>]. Accessed Jan. 20, 2007.

²¹ The proposals, presented as an “Energy Policy for Europe,” are available at [http://ec.europa.eu/energy/energy_policy/index_en.htm]. Accessed Jan. 20, 2007.

need for secure and reliable fossil fuel transit routes in a new EU-Russia Partnership and Cooperation Agreement. Finally, the Commission envisions an enhanced dialogue between major consumer countries, focusing on the need for European-U.S. cooperation on promoting free energy markets, energy efficiency, regulatory frameworks, and research.

In the area of sustainability, the Commission proposes a 20% EU-wide reduction in carbon emissions compared with 1990 levels by 2020. It also urges EU member states to seek international agreement on a 30% reduction target by 2020 in a Post-Kyoto Protocol carbon emissions treaty. To attain these goals, the Commission envisions a 50% increase in EU-spending on carbon technology over the next seven years and a series of measures to increase the use of biofuels and other renewable energy sources and to improve EU-wide energy efficiency by 20% by 2020.

Most observers consider the European Commission's call to increase competition within and among traditionally protected European energy markets to be its most controversial initiative. Here, the Commission highlights the need to reduce the power of state-owned energy companies by forcing them to split up ownership of generation and distribution businesses. Some member governments have signaled opposition to this proposal, prompting some experts to predict a compromise agreement that would allow the continued operation of national energy industries but subject them to oversight from an independent European regulatory body.

Although European leaders increasingly pay lip-service to the need for enhanced energy cooperation, observers emphasize the need for improved coordination between EU institutions (Council, Commission, Parliament) and among the member states before a successful common approach can be realized. From this perspective, the success of an EU energy strategy will depend on the ability of member states to frame common objectives in addressing three fundamental challenges. First, how to develop strong partnerships with energy producing and transit regions; second, how to use existing indigenous energy resources while seeking to curb overall consumption; and third, how to establish an internal system to provide dependable and secure energy supplies to all of Europe.

Challenge 1: An External Policy for Energy Security

Growing energy demand within the EU's 27 member states is mirrored in regions throughout the world.²² Growth in China and India has added considerably to global demand, as has rising population growth and economic modernization in Latin America, Africa, and even the energy-rich Middle East. In the face of this strain on limited supplies, Europeans must compete for existing and new energy sources.

Most experts agree that without a significant effort to diversify, future increases in gas imports will be supplied predominantly by Russia. Taking the projections of

²² The European Commission estimates that European electricity demand alone is growing by 1.5% annually. See "An Energy Policy for Europe," *Op. Cit.*

European energy consumption and supply into account, it becomes clear that the most important energy security challenge facing the EU over the next 20 years will be Europe's ability to diversify the sources of its energy imports and the modes of transit that will bring those supplies to Europe.

In June 2006, the European Council endorsed the Commission's call to include energy security as a part of the Union's Common Foreign and Security Policy (CFSP), stating that "The development of a coherent and focused external EU energy policy, drawing on the full range of EU internal and external policies, would enhance the collective external energy security of the Union."²³ In its endorsement, the Council made it clear that individual member states had the right to pursue their own external relations in securing energy supplies. However, the Council argued that the EU may in a better position to determine what leverage could be used to advance the collective interests of the Union as a whole.

Diversification of supply is considered essential to Europe's future energy security. The bulk of the world's energy resources, located in Russia, the Caspian region, the Middle East and North Africa, are all well within the economic reach of the European Union. In fact, Europe already receives energy supplies from each of these regions. Several EU member states, however, have expressed alarm over Europe's growing dependence on Russia and have suggested the EU turn its attention to securing more supplies of gas and oil from these other regions. The key for Europe is to determine the equilibrium point for supply from each geographic region and how to best manage relations with the governments in those regions that control the energy resources. By strengthening relations with these other regions, the EU opens additional options for its external energy strategy.

Russia. Russia is a major player in world energy markets. In 2004, its 1,700 trillion cubic feet (tcf) of natural gas reserves were the largest of any country, making it both the world's largest gas producer and exporter. Russia is also the world's second largest oil exporter.²⁴

The EU, on the other hand, needs reliable energy supplies to support European economic growth. Russia's resources and proximity to Europe make an EU-Russian energy partnership a necessity. Indeed, managing relations with Moscow has become the EU's top energy security priority. This relationship was formalized in 2000 with the creation of the EU-Russia Energy Dialogue. The results of the Dialogue have been mixed. At the last meeting in May 2006, the sides were unable to resolve differences regarding supply security and investments in each others energy sectors. Compounding Europe's dilemma is the fact that 100% of Russian gas flowing to the EU is controlled by the state-owned energy enterprise, Gazprom. Though many observers remain skeptical regarding Russian President Vladimir Putin's willingness to make commitments being sought by the EU, both Putin and EU leadership have

²³ "An External Policy to Serve Europe's Energy Interests," Office of the High Representative, European Council, June 2006. Document S160/06.

²⁴ For additional information on Russia's energy situation see CRS Report RS22378, *Russia's Cutoff of Natural Gas to Ukraine: Context and Implications*, by Jim Nichol, Steven Woehrel, and Bernard A. Gelb.

announced their intention to negotiate a renewed Russia-EU partnership agreement with a significant energy component during Germany's EU presidency in the first half of 2007.²⁵ On the other hand, Russia's continued refusal to ratify the Energy Charter Treaty that guarantees open competition throughout the energy sector, and its reluctance to adhere to the EU's competition and anti-monopoly rules, are considered by many to have been major factors in the failure of scheduled partnership talks in late 2006. The willingness of either side to compromise on these issues during 2007 partnership talks will likely be a key factor in future EU-Russian relations.

Most observers contend that Putin views Russia's vast energy resources as a tool to regain Russia's stature as a major force in global affairs.²⁶ Thus, he sees energy as an important political force as much as it is the force driving Russia's economic development. Experts believe that Russia seeks to control as much of Europe's energy infrastructure as possible in return for its delivery of reliable energy supplies. Moscow knows that if the EU is successful in creating a Europe-wide single market for electricity and gas, which is discussed later in this report, "it will be presented with opportunities to become part of the world's largest and most integrated energy market right on its border."²⁷ According to Daniel Yergin, "Putin believes that energy security is about [Russia's] retaking control of the 'commanding heights' of the energy industry and extending that control downstream..."²⁸

Energy's political importance is evident in the fact that the two major Russian energy giants, Gazprom and Rosneft, have close ties to the Kremlin and, in particular, to President Putin himself. Rosneft is led by a close associate and former KGB colleague of Putin. Gazprom is run by Alexy Miller, a close Putin ally, and Dmitry Medvedev, Russia's First Deputy Prime Minister who, according to some, is being groomed by Putin to become his successor in 2008 when Putin is due to step down as President. Gazprom dominates the Russian gas sector and controls Russia's export pipelines.

On the investment side, analysts also see Russia playing the political card. The International Energy Agency estimates that the Russian gas sector will require upwards of \$10 billion in annual investment to meet future global demands. The EU has urged Russia to provide European energy companies the opportunity to invest in the total range of the energy sector from oil and gas fields to the pipeline system. Thus far, Russia has refused to meet EU demands and in turn, has warned the EU not to attempt to block Gazprom's plans to buy or invest in Europe's energy sector.

²⁵ "Merkel calls for Improved EU-Russia Energy Ties," *Deutsche Welle*, Jan. 21 2007.

²⁶ "Russian Energy Policy and its Challenges to Western Policy Affairs," Keith Smith, Center for Strategic and International Studies, testimony before the Congress, May 16, 2006.

²⁷ "Russia-EU Relations: An Emerging Energy Security Dilemma," Andrew Monaghan, *Russia Research Network*, London, 2006.

²⁸ "What Does Energy Security Really Mean?," Daniel Yergin, *Wall Street Journal*, July 11, 2006.

Brushing aside the EU's policies regarding competition and monopoly practices, as well as the Energy Charter, Gazprom CEO Miller told EU Ambassadors in a not so veiled attempt to exert its energy-driven influence that "attempts to limit Gazprom's activities in the European market...will not produce good results...it is no coincidence that competition for energy resources is growing...and it should not be forgotten that we [Gazprom] are actively seeking new markets such as China..."²⁹

Russia's reluctance to agree to EU terms for open and competitive markets has led many in the EU to express concern over Russia's political reliability as a long-term supplier. Nonetheless, Russia's recent decision to build the new Baltic Sea pipeline to Germany, its development of the large Shtokman gas field in the Barents Sea, the recent purchase of gas storage facilities in Hungary from Germany and its continuing interest in the British energy market all confirm the fact that Moscow understands that Europe will continue to play an important role in Russia's long-term global political and economic strategy.

However, just as Russia seeks to exploit European dependencies, Europe's understanding of Russia's dependence on Europe as a stable customer and an eager investor in Russia's economy presents the EU with several options in managing energy relations with Russia.

First, Some analysts believe Russia cannot develop its vast energy reserves without capital and technological investment from the west. However, many question how far EU member states will agree to push Russia (and Gazprom) to adopt the EU's principles of competition, open its energy sector to outside investment, and ratify the Energy Charter. Some believe that without such demands for concessions, Europe will ultimately find its energy security largely under Russian control.

A second issue involves the EU's ability to influence the attitudes and actions of its 27 member states as it tries to establish a coherent policy toward Russia. This question may be the most problematic for the EU. Even as EU leadership in Brussels moves forward with its ideas on a common external energy strategy, several member states have pursued bilateral energy deals with Russia that will increase their dependence on Russia for years to come.

Both Germany and Italy, the largest importers of Russian gas, have negotiated long-term deals with Russia to lock in future gas supplies. For Germany and a few others, "Russia's role as a key supplier of oil and gas makes Putin a vital strategic partner who cannot be ignored or antagonized."³⁰ Such deals are not limited to the major energy consumers. Slovenia and Belgium have entered into negotiations with Gazprom to build a pipeline across the former and to enter the gas distribution market in the latter. Hungary's oil and gas company, Mol, has joined with Gazprom to

²⁹ Gasprom CEO Miller in a speech to EU Ambassadors in Brussels as reported by the BBC News, April 4, 2006.

³⁰ "Russia: More Awkward, But Still Indispensable," William Drozdiak, *European Affairs*, Spring/Summer 2006.

extend Gazprom's Blue Stream pipeline across the Black Sea through the Balkans into Hungary.

These examples of individual member states dealing with Russia have drawn harsh criticism from other member states, such as Poland and the Baltic states. They have warned their European colleagues not to cut energy deals that will give Russia an undue and possibly dangerous amount of political influence over European decision-making. Many of these nations understand that Europe's dependence on Russian energy is likely to last no matter what alternatives are included in an EU energy policy. But they also feel Europe does not gain real security by becoming more dependent on Russia. In fact, the growing presence of Gazprom throughout the European energy market has led many to worry about the EU's ability to develop an energy policy insulated from Gazprom's influence.³¹ In a July speech, Romania's President Basescu went so far as to warn that "Europe's dependence on Russian gas monopoly Gazprom ...could be the biggest threat to the region since the former Soviet Union's army."³²

Critics of Europe's growing dependence on Russian energy, especially on gas, point out that the 2005-2006 Ukrainian and early 2007 Belarusian gas and oil crises were not isolated examples of Russia's use of energy as a foreign policy tool. As Ambassador Keith Smith has suggested, Russia's practice of purchasing gas from the Central Asian Republics is designed to deny the west the ability to buy less expensive gas from other sources. He also points out that Russia's decisions to halt shipments of oil from Kazakhstan to Lithuania through Russian oil pipelines was an expression of displeasure with Lithuanian policy.³³

Several nations are attempting to diversify their energy supplies but are concerned that Gazprom could use its influence to block EU decisions on alternative energy initiatives that would lower Europe's dependence on Russia or that would compete against Gazprom's interests. For instance, the Russia-Hungary pipeline agreement will compete with the EU-endorsed Nabucco pipeline which would bring gas from the Caspian region and Iran to Europe via Turkey and the Balkans.

Critics of Gazprom activities, such as Vladimir Socor, believe that Gazprom's strategy is to "establish permanent control of the [Hungary/Balkans] markets before Caspian gas can reach them through the proposed Nabucco pipeline..."³⁴ In moving ahead with this deal, critics believe Gazprom will try to convince other nations that agreed to fund the Nabucco pipeline to withdraw their commitments and rely on the Russia-Hungary pipeline instead.

³¹ Comments provided through discussions with representatives of several European member states.

³² Traian Basescu, President of Romania in a speech to the Jamestown Foundation in Washington, D.C. July 2006.

³³ "Security Implications of Russian Energy Policy," Keith Smith, Policy Brief, Center for European Policy Studies, January 2006.

³⁴ "Gazprom Broadens, Deepens Inroads Into European Union's Internal Markets, Transport Systems," Vladimir Socor, *Eurasia Dailey Monitor*, March 21, 2006.

The energy situation with Russia is not dire. Russia will continue to be Europe's primary energy supplier for the long-term, and healthy Russian-European relations remain a priority on both sides. However, some member states indicate a growing desire to resist increased cooperation with Russia. If a common external EU energy security policy is to emerge, two options may be considered. First, Europe may move to curb its dependence on Russian energy by increasing its diversification to other regions without threatening Russia's own market security in Europe. In doing so, Europe might ask if there is a point at which Russia could decide that the EU's commitment to diversification no longer makes it financially attractive for Russia to continue to invest in new supplies destined for the European market. Second, Europe may attempt to adapt the behavior and practices of Gazprom as it becomes more of a dominant energy player in Europe. Thus far, few European countries have demonstrated restraint in seeking bilateral deals with the Russian monopoly that would do just that. If this continues, Europe could risk having Gazprom interfere more and more in its internal political decision-making. To avoid this, the European Union will likely continue to apply pressure on Gazprom to play by Europe's rules on competition and work to change Gazprom's corporate mentality by allowing European firms to invest in Russia's gas industry.

Caspian Region/Black Sea. Consideration of an EU energy supply diversification strategy will likely place more emphasis on the Caspian and Black Sea regions. Indeed, the EU's January 2007 energy policy paper recommends strengthening the EU's so-called Neighborhood Policy with these areas.

The Caspian Sea in central Asia is bordered by Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan. After the collapse of the Soviet Union, the international community took an active interest in the region because of the potential oil and gas reserves thought to be located in at least six identified hydrocarbon fields beneath the Caspian Sea.

Presently, the Caspian Sea region is a significant, but not major, supplier of crude oil to world markets. The untapped reserves held by four of these nations might offer Europe an opportunity to move away from increased dependence on Russian energy. Estimates of the Caspian Sea region's proven oil reserves range between 40 and 50 billion barrels. Production levels in 2005 were estimated to be around 2 million barrels per day. The Caspian Sea region's natural gas reserves are estimated at 232 trillion cubic feet (Tcf). Natural gas production in 2004 was approximately 5 Tcf.

Europe's formal interest in the energy resources of the region dates back to 1995 with the creation of the Interstate Oil and Gas Transport to Europe program (Inogate). This EU initiative (currently with 21 member countries) was designed to promote the construction of regional pipeline systems in order to facilitate the transport of oil and gas to Europe.³⁵ This was followed by another EU proposal, the "Baku Initiative," which was launched in November 2004 with the participation of the European Commission and the Black Sea and Caspian littoral states. The Baku Initiative was

³⁵ A more detailed account of the activities of Inogate is available from its website at [<http://www.inogate.org>].

designed to facilitate the progressive integration of the energy markets of the region into the EU market as well as the transportation of the extensive Caspian oil and gas resources towards Europe.

At the time Inogate was formed, Russia dominated both oil and gas production and distribution in the region. Since most of the countries involved are landlocked, their oil and gas had to be transported via pipelines. Reflecting Soviet era dictates and infrastructure, nearly all Caspian crude oil traveled north or west via pipeline to or through Russia to European markets. Some oil also went by tanker through the Bosphorus straits to Western European markets via the Mediterranean. Natural gas transportation was tied to pipelines traveling mainly north or west through Russia and its monopoly pipeline system — Gazprom. This has provided Russia with the market power to dictate, in part, the price it is willing to pay for the oil or gas, to set transit fees on Caspian energy shipped through its transportation network, and to determine in some cases how much, if any, it is willing to transport. This latter point was evident in 2005 when Russia's oil pipeline company, Transneft, refused to allow oil from Kazakhstan to be shipped through its pipeline system to Lithuania for refining. The Caspian region nations thus have incentives to develop alternatives to routes through Russia to reach European and other markets and provide leverage in negotiating transit fees on shipments that do go through the Russian pipeline system.³⁶

Changing the region's energy flow from the existing North-South axis to an East-West axis toward Europe is integral to the development goals of these newly independent states and Europe's energy strategy. Currently, the region relies on three big pipeline projects which will reduce the region's dependence on Russia. The Caspian Pipeline Consortium (CPC) project connects Kazakhstan's Caspian Sea area oil deposits with Russia's Black Sea port of Novorossiysk. Oil loaded at Novorossiysk is then taken by tanker to world markets via the congested Bosphorus Straits.³⁷

The Baku-Tbilisi-Ceyhan oil pipeline (BTC), which opened in July 2006, exports oil from Azerbaijan and up to 600,000 bl/d from Kazakhstan along a 1,040-mile route from Baku, Azerbaijan via Georgia to the Turkish Mediterranean port of Ceyhan. This will allow oil to bypass the Bosphorus Straits.

The South Caucasus Pipeline (SCP), a new gas pipeline venture completed in December 2006, runs parallel to the BTC oil pipeline for most of its route before connecting to the Turkish energy infrastructure and on to Europe via a transit pipeline through Greece.

In addition to these pipelines already in service, several additional projects in Europe could be involved.

³⁶ For additional information see CRS Report RS21190, *Caspian Oil and Gas: Production and Prospects*, by Bernard A. Gelb.

³⁷ Additional analysis of the Caspian region can be found at, "Country Analysis Brief: Caspian Sea," Energy Information Administration, U.S. Department of Energy, 2005.

One option for additional oil transport would be to upgrade the existing oil pipeline which runs from Baku in Azerbaijan to Supsa in Georgia. That line could be extended under the Black Sea or the oil could be loaded onto tankers and shipped to Odessa, Ukraine. The oil could then be pumped through the Odessa-Brody pipeline into Poland. Some, including the Poles, have suggested that the Brody line be extended to northern Poland and possibly into the Baltic states for use at the Mazeikai refinery in Lithuania.

On the gas front, two additional projects offer important options for Europe. One, the Trans-Caspian pipeline, is intended to bring additional gas from the Caspian to Georgia and across the Black Sea to Romania and the Balkans. The other pipeline, Nabucco, is scheduled to be built in 2008 and would carry gas through Turkey into Bulgaria and on to Austria. This project has the financial backing of several European nations and the endorsement of the EU. Both pipelines have been opposed by Russia, and Gazprom is trying to peel off the support of at least Hungary by offering an alternative service.

There can be no doubt that the energy resources of the Caspian Sea region can offer Europe a viable alternative source of energy supply. However, the full realization of the energy potential of the region could be impeded by several factors.

One issue that continues to raise questions regarding regional stability is the unresolved legal status of the Caspian Sea. Despite a number of efforts, so far only Azerbaijan, Kazakhstan, and Russia among the littoral states have reached agreement on delineating ownership of the Sea's resources or their rights of development. The EU could offer its legal assistance to help resolve outstanding issues.

A second issue is the ability of the EU to work to ensure the long-term political stability of the region. The conflict between Azerbaijan and Armenia over Nagorno-Karabagh leaves the BTC and the future SCP pipelines vulnerable to sabotage. Internal political strife involving Georgia and its two breakaway regions also threatens future pipelines through that country. Continued political uncertainty in Ukraine and growing Iranian influence in the southern Caucasus could deter future long-term investment by the private sector. However, the January 2007 entry of Romania and Bulgaria into the European Union and the EU's special relationship with Turkey should help keep the Black Sea region settled.

A third issue involves the willingness of the EU to compete with Russia for political and economic influence in the region and to prevent Gazprom from closing off the Caspian market, or at least the Central Asian part of the region, to Europe and its private sector. Russia's higher priced gas exports to Europe depend on Gazprom's ability to control gas exports from Kazakhstan and Turkmenistan. This dependency is expected to increase over the next 7-10 years until Russia's huge gas fields in the Barents Sea come on line.³⁸ According to some, although Gazprom was unable to prevent the BTC pipeline from being completed, Gazprom intends to continue to press the countries around the Black and Caspian Sea regions to agree to gas supply and transit arrangements that satisfy the company's goals of channeling lower-cost

³⁸ Keith Smith, *Op. Cit.*

Central Asian gas to Russian customers and protecting its lucrative European market.³⁹ Gazprom has already locked-up much of Turkmenistan's gas in a 25-year contract and is pursuing a similar strategy toward Kazakhstan.

The final issue revolves around whether Europe is the optimal market for Caspian oil and natural gas. Oil demand over the next 10 to 15 years in Europe is expected to grow by little more than 1 million bl/d. Oil exports eastward, on the other hand, could serve Asian markets, where demand for oil is expected to grow by roughly 10 million bl/d over the next 15 years.⁴⁰ In fact, China, which opened an oil pipeline to Kazakhstan in 2005, sees Kazakhstan as a major source of oil for the long term.

The Caspian region will continue to be an important source of energy production for the foreseeable future, especially if the estimates of its reserves, particularly its gas reserves, are accurate. Thus, the region can contribute to the diversification of oil and gas supplies to Europe, which will add to Europe's energy security. Taking full advantage of this potential will require a strong commitment on the part of the EU to encourage the private sector to take the financial risks associated with securing a share of the Caspian energy market for Europe and to set forth an external strategy that is fully prepared to address the dynamics of the entire region. For some, "a credible energy [strategy] needs to demonstrate that the EU means business in the Caspian/Black Sea regions. Brussels must include energy supply and transit as high priorities... for the region."⁴¹

Middle East/North Africa. The EU's desire to seek alternative sources of energy in order to lessen Europe's dependence on Russia confirms the need expressed by many in Europe that relations with the Middle East and North Africa require a stronger political and economic commitment.

The Persian Gulf countries (Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) hold approximately 715 billion barrels (bb) of proven oil reserves, representing over half (57%) of the world's oil reserves. The region produces about 31% of the world's oil. It is estimated that by 2020, the Persian Gulf region will produce about 35 million barrels of oil per day.⁴² In addition, Libya is estimated to hold 40bb and Algeria 12bb. In addition to its oil capacity, the Persian Gulf region holds an estimated 2,400 trillion cubic feet (tcf) of natural gas reserves, representing 45% of the world total gas. Algeria is estimated to hold (161tcf), and Libya (52tcf).⁴³

³⁹ "Energy Supplies to Eurasia and Implications for U.S. Energy Security," Zeyno Baran, testimony before the Senate Foreign Relations Committee, September 2005.

⁴⁰ CRS Report RS21190, *Op. Cit.*

⁴¹ "What Role for the Black Sea Region in the European Union's Energy Strategy," *Eurasia Dailey Monitor*, March 3, 2006.

⁴² For additional information see "Persian Gulf Oil and Gas Exports Fact Sheet," Energy Information Administration, U.S. Department of Energy.

⁴³ See *Statistical Review of World Energy*, British Petroleum (BP), June 2006.

Europe already depends on the Middle East/North Africa region for close to 30% of its oil imports and approximately 15% of its piped gas. In 2005, Europe imported approximately 3.1million b/day of oil from the region. The largest portion of that oil comes from Saudi Arabia followed by Libya and Iran.⁴⁴ Europe's primary supplier of natural gas has been Algeria, via two pipelines that enter Europe through Italy and Spain. A smaller amount comes from Libya via pipelines to Italy. Two additional gas pipelines from Algeria to Spain and Italy are under construction.

Perhaps the most important development for Europe in this region has been the growing availability of liquified natural gas (LNG). Today, Europe accounts for approximately 8% of the world's total consumption of LNG. Spain and Italy are the primary importers of LNG. Europe's LNG infrastructure of terminals and re-gasification facilities is relatively modern especially along the Mediterranean coast. Italy is currently engaged in a partnership with British Gas to build a modern facility in the port of Brindisi and has a plan for up to ten additional facilities. The principal suppliers of LNG to Europe include Algeria, Egypt, Oman and Qatar. Algeria is the world's third largest exporter of LNG, with almost all of its gas (25b cubic meters) going to Europe. Recently, the Algerian national oil company, Sonatrach, signed a 20-year LNG supply contract with the Spanish power company Endessa.⁴⁵

LNG has also become a major factor in the development of gas exports from the Persian Gulf. Although nations such as Qatar, Oman and the United Arab Emirates have produced LNG for the Asian market, European energy companies have begun to express more of an interest in purchasing LNG from the Gulf as well. With vast amounts of gas reserves the Gulf states are positioned to meet a portion of Europe's future demand.

European relations with the states of the Persian Gulf and North Africa have steadily improved over the years. EU relations with North Africa were formalized in 1995 with the creation of the Euro-Mediterranean Energy Partnership. The EU has also created the EU-Gulf Cooperation Council (GCC) Dialogue with the states of the Persian Gulf and has initiated a formal dialogue with the nations of OPEC. European energy companies have also become more involved in the Middle East.

The potential for growth in Europe's energy diversification strategy with respect to the Middle East and North Africa is significant. However, European competition with Asia and North America and long-term political instability throughout the region will likely temper the degree to which Europe seeks to increase its reliance on the region. Nevertheless, as with the Caspian region, if the EU is serious about lowering its dependency on any one source, it must turn more and more to the Middle East. Parenthetically, Europe's growing interest in energy resources in North Africa has not gone unnoticed by Russia and Gazprom. Just as in the Caspian region, Russia appears to be bolstering its efforts to enter Europe's energy plans. In March 2006, President Putin, along with Gazprom officials, traveled to Algeria to discuss Russian participation in Algeria's future oil and gas projects, including its LNG export markets. It appears that because Russia intends to make Europe a major

⁴⁴ "EU Energy Policy Data," *Op. Cit.*

⁴⁵ As reported by Lloyd's List, May 25, 2006.

market for LNG produced from its Shtockman gas field in the Barents Sea, Russia wants to be in a position to influence Algeria's future role as a major supplier of energy to Europe.

Norway. Norway, a non-EU member state, is the second-largest exporter of natural gas to the EU, behind Russia. Norway exported, via pipeline, approximately 2.0tcf of natural gas to the EU in 2004, representing 17% of European gas consumption. Germany (25%), France (30%), and the United Kingdom (30%) are the largest consumers of Norwegian gas exports.⁴⁶

Norway had 73.6 trillion cubic feet (Tcf) of proven natural gas reserves as of January 2005. The North Sea holds the majority of these reserves, but there are also significant quantities in the Norwegian and Barents Seas. Norway is the eighth-largest natural gas producer in the world, producing 2.59 Tcf in 2003.⁴⁷ The United States Geological Survey has estimated that almost 25% of the globe's yet to be discovered resources are located in the Arctic region. Norway's recently opened Snohvit gas field along with Russia's field at Shtockman will make the Barents Sea a new European energy region.

According to industry estimates, Norway had 8.5 billion barrels of proven oil reserves as of January 2005, the largest in Western Europe. The bulk of Norway's oil production occurs in the North Sea, with smaller amounts in the Norwegian Sea. In 2005, Norway's oil production averaged 2.95 million bl/d. As North Sea fields continue to mature, Norwegian oil production will likely remain steady for several more years and then begin to decline. There is some hope that new developments in the Barents Sea will offset some of this decline. The largest single recipient of Norway's oil exports is the United Kingdom, which imports around 814,000 bl/d from Norway, or 34% of Norway's total exports. Other significant destinations include the Netherlands and Germany.

Norway's entry into the LNG export market opens a new opportunity for the EU to work with its northern neighbor on energy security issues. Norway's energy giant, Statoil, plans to construct the first large-scale LNG export terminal in Europe, with connections to the Snohvit project. Although the initial LNG production from the Snohvit project has been committed to the United States, follow-on production and future fields in the Barents Sea could be shipped to facilities in Europe. The EU has recognized the growing importance of Norway in Europe's energy security debate and has expressed interest in "facilitating Norway's efforts to develop resources in the high north of Europe."⁴⁸ Individual European nations have also recognized Norway's potential future role in providing secure energy. Poland, along with the Baltic states, has already begun discussing with industry the construction of an LNG

⁴⁶ "The High North-Top of the Agenda," Jonas Store, Minister of Foreign Affairs, Norway in a speech at the Center for Strategic and International Studies, Washington, D.C., June 2006; "EU Energy Policy Data," *Op. Cit.*

⁴⁷ Energy Information Administration.

⁴⁸ European Commission Green Paper, *Op. Cit.*

terminal along the Polish coast to receive LNG from Norway for transport to other parts of Europe.

External Strategy Conclusion. Establishing a diversified network of secure energy suppliers has become one of the foremost challenges facing the nations of Europe and its Union. In one sense, Europe is fortunate to have such large sources of available energy within a relatively small geographical space. However, like other countries, Europe faces the fact that for the foreseeable future, those energy producing nations pose different levels of risk, ranging from outright political instability to more subtle questions of political reliability and long term intentions.

The EU, through its Common Foreign and Security Policy (CFSP), can continue to work on the political stability and security of Europe's energy suppliers by offering stronger foreign and trade relations. However, perspectives on energy security policy differ among the 27 member states themselves and between the states and the European Commission. Long-term bilateral energy agreements such as the Baltic pipeline agreement between Russia and Germany, and LNG contracts signed between Spain and France and Algeria, are examples of member states unilaterally addressing their own energy supply security needs. These decisions may or may not take broader Union security into account. But, bilateral agreements between member states and Russia, Algeria, the Middle East or the Caspian producers could become more commonplace unless the European Commission can effectively convince member states that the continued uncoordinated practice of bilateral energy policies may not bring long-term energy security to the Union as a whole, especially if the member states gravitate to only one energy supplier.

One analysis of the European Union's dilemma on forming a common energy policy concluded: "if member states revert to national approaches, including energy related foreign policy making, this strategy may not only interfere with EU energy policy, it could also effect broader EU foreign and security policy... this implies that the EU has no alternative but to develop a coherent energy security policy..."⁴⁹ For many, the European Commission's proposals that serious consideration be given to a common European energy policy makes sense. Nonetheless, progress towards a common external energy security strategy tied to the EU's CFSP appears to require far more coordination than has been demonstrated heretofore.

Challenge 2: Promoting Indigenous Energy Supply

Europe's dependence on imported energy, especially gas, will continue to grow. Commission estimates suggest that if nothing is done to address energy dependence, Europe will import 65% of its energy requirements by 2030.⁵⁰ A 2003 Oxford Analytica paper prepared in 2003 reviewing the impact of the European Commission's drive to open Europe's energy markets suggested that "liberalization tends to favor lower capital cost commitments (as opposed to the longer-term

⁴⁹ "Energy Supply Security and Geopolitics: A European Perspective," Aad Correlje and Coby van der Linde, *Energy Policy*, 34, 2006.

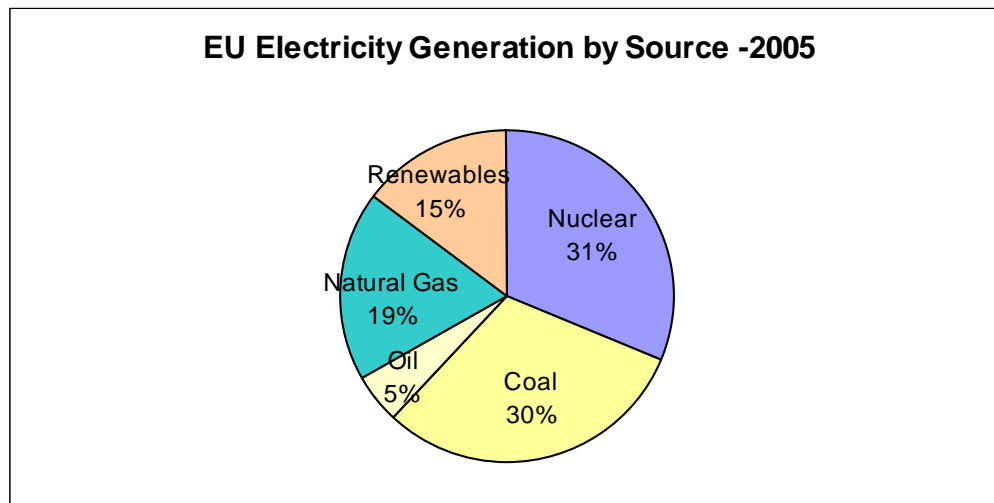
⁵⁰ "AN Energy Policy for Europe," *Op. Cit.*

investments). The major beneficiary of liberalization has been natural gas...⁵¹ The report implies that because of its competitive price and the lower investment cost to deliver gas as opposed to oil or renewable fuels, market forces would encourage nations to switch to gas. The paper concludes that this “has serious implications for energy security due to increased reliance on a fuel which is increasingly secured from outside the EU”.⁵²

Thus, while efforts to develop a strong and coherent external energy policy toward energy producing and transit regions remain a top European priority, the EU must look inward to determine how its dependence on imported energy can be mitigated through the availability of indigenous energy supply, the efficient use of energy and the development of alternative energy supplies, including a strategy for renewable energy. Indeed, the Commission’s January 2007 call for a European energy policy recommends ambitious targets for the development of cleaner and renewable energy sources and increased energy efficiency over the coming decades.

Roughly 60% of power generation throughout the EU in 2005 was produced by either nuclear energy or the burning of coal. The following chart illustrates the break down of power generation by fuel.

Figure 2. EU Electricity Generation



Source: IEA.

The mix of these different fuels as a source of electrical generation varies greatly among the 27 member states. Each national government or national energy company decides what mix of energy will actually be utilized. Those decisions are often based on availability of a fuel or its price. In France, for instance, nuclear power accounts for over 70% of all electrical generation, while in Poland and the Czech Republic coal is the dominant fuel. Member state decisions on the mix of energy for power generation will also be driven by Europe’s commitment to the environment and its

⁵¹ “European Union: Energy Market Poses Policy Challenges,” Oxford Analytica, August 2003.

⁵² Oxford Analytica, *Op. Cit.*

obligations under the Kyoto Protocol. Under the 1997 Protocol, the EU is obligated to reduce its carbon emissions by 8% from its 1990 levels by 2012.

Current EU President Germany has said that forging international agreement on a post-2012 carbon emissions target should be a priority in 2007, and the Commission's January 2007 recommendations call for the EU to seek a 30% reduction from 1990 levels by 2020 in its negotiations. Barring international agreement, the Commission calls on member states to reduce emissions by 20% from 1990 levels by 2020. To the extent Europe intends to meet these targets, decisions regarding the energy mix utilized by the member states will be important.

Nuclear. Nuclear power accounts for roughly one-third of Europe's overall electrical generation. There are approximately 175 nuclear reactors in operation in Europe today. Some nations such as France, Finland, Sweden and the UK rely heavily on nuclear power. Nuclear energy is considered clean energy and viewed by many as posing little danger to the environment. Others oppose nuclear power on the grounds that it is dangerous and creates a difficult waste disposal problem. Several countries such as Germany and Spain have committed to phasing out all of their nuclear reactors over the next several years and replacing those with gas powered facilities, although a few of those countries are rethinking their decisions or are at least looking at extending the timetable for the phase out. By contrast, other countries such as the United Kingdom, Finland and Lithuania have decided to add new reactors. Given the substantial costs of putting a nuclear reactor on line and the controversial nature of nuclear waste, it is unlikely that Europe will see a resurgence of new nuclear reactors in nations where nuclear power does not already play a role. At best, those nations that already utilize nuclear power will either replace or upgrade existing reactors.

One promising alternative for the future could be found in the International Thermonuclear Experimental Reactor (ITER) program. The EU has joined the United States and several other nations in an effort to produce electrical power from nuclear fusion which unlike current nuclear power does not generate dangerous waste. The first facility will be constructed in France but the first results of the program are not expected for at least 15-20 years.

Coal. Just over one-third of the total electricity generated in Europe is coal fired. Coal is plentiful in Europe with proven reserves of close to 40 billion tons.⁵³ However, coal burning is a major source of carbon dioxide emissions. A European Commission Directive put into force years ago could force many coal fired plants to shut down unless they install clean burning technology. That technology, although expensive, does exist and can capture 80-90% of the carbon (CO₂) by-products of burning coal. While several electricity producers in a few countries which currently rely on coal for power generation, such as Spain (22%), Germany (52%), the UK (35%) and the Czech Republic (62%), have indicated an interest in upgrading their generation facilities with new clean coal technology, none of the European countries has adopted this technology on a broad commercial basis.

⁵³ Coal Market Outlook, European Commission, 2005.

Coal is likely to remain a source of fuel for energy production for the foreseeable future in those countries where it already plays a role. Germany, for instance, has plans to build eight new coal burning facilities. But, for the long term, the ability of member states to meet their commitments to lowering carbon emissions, the potential for using renewable energy, the price of natural gas, and the cost of installing clean coal burning technologies will likely dictate whether coal can remain a viable alternative energy source for Europe.

Renewable Energy. Hydro, wind, solar and bio-mass energy currently account for just under 7% of Europe's total energy consumption and 15% of its electricity generation. Although some see Europe as fairly energy efficient today, the EU has set targets to reduce carbon emissions by mandating that 12% of total European energy consumption be fueled by renewable energy sources by 2010. The EU has asked each member state to set its own target for the use of renewable energy in order to help achieve the overall EU target. Some countries, like Austria (78%) and Sweden (60%), have set ambitious targets, while others, such as the United Kingdom (10%) and Ireland (4%), are less ambitious.⁵⁴ The EU has also committed to having biofuels account for 5.75% of all petroleum and diesel by 2010. Nonetheless, noting that the renewable share of total energy consumed in the EU is unlikely to exceed 10% by 2010, the European Commission has called on member states to agree to a 20% reduction target by 2020 at the EU's March 2007 summit.

Although EU-wide support for renewable energy is strong, individual member states' renewable energy portfolios vary. For instance, Austria and Latvia promote hydro power, while the Czech Republic and Portugal have committed financial support to large solar energy facilities. Germany, Sweden and the UK support major wind farms along their coasts. Bio-mass and bio-fuel programs are becoming more attractive. In December 2005, the European Commission adopted an "action plan" designed to increase the use of energy from forestry, agriculture and waste materials. Although bio-fuels are more expensive to produce, their use is increasing especially in the transport sector. However, bio-mass and bio-fuel programs represent only a fraction of electricity production in Europe and the future for these programs will depend on cost of production and whether the EU or member states are willing to subsidize their development on a large scale. In its January 2007 proposal, the Commission proposes a 2007 EU legislative measure to increase investment in these sectors.

With the encouragement and financial support of the European Commission, each EU member state has committed itself to developing programs to support the use of renewable energy. Long-term support for the increased use of these alternatives, however, will depend on the future price of imported gas, whether that price will make public or private investment in renewable energy more cost attractive and whether the electricity produced from these sources can be efficiently and cost-effectively integrated into Europe's internal electricity market. These decisions will depend on the EU's willingness to increase its financial stake in the development of renewable sources on a Europe-wide basis. However, it is unclear at this time

⁵⁴ "Renewable Energy Targets for 2010," International Energy Agency, World Energy Outlook, 2004.

whether the use of renewable energy will provide a significant alternative to the use of oil, gas or coal for peak electrical generation or heating throughout Europe in the foreseeable future.

Challenge 3: Providing Energy Security through An Internal Energy Market

Developing stable and reliable external energy partnerships and encouraging the development and use of alternative energy supplies, including safe nuclear power, clean coal and renewable energy, will likely help meet Europe's energy security goals. A third challenge for the EU is to develop a comprehensive and efficient Europe-wide internal market for gas and electricity transmission and distribution regardless of the source of the energy supply.

To address this particular challenge the European Commission considers the completion of the internal energy market a major priority of the proposed EU energy policy.⁵⁵ The concept of a 'single market,' which would remove barriers to trade and allow the free movement of capital, services and labor throughout the EU, first emerged in 1985 under then Commission President Jacques Delors. The debate over extending that concept to a "liberalized" internal energy market debuted in 1989 and culminated in two 'Directives' issued by the Commission in 1996 and 1998 respectively and updated in 2003.⁵⁶ The goal of the Directives was a fully open and competitive energy market.

The Directives had four objectives: (1) to implement the single market for energy by promoting competition and efficiency in the production and delivery of electricity and gas; (2) to lower prices and give all EU customers the opportunity to choose their energy supplier by 2007; (3) to help improve the environment; and (4) to enhance energy security. To accomplish these, the EU and its member states will have to agree on a clear set of guidelines as to who owns, controls, regulates and has access to the electrical energy grids, pipelines and emergency energy storage facilities.

Since implementation of the gas and electric Directives, many EU member states have opened their markets at varying speeds and have demonstrated a mixed record of achievement. Part of the reason for the slow pace of market liberalization in some nations has been due to an unenthusiastic commitment from many governments and their energy industries. Most member states regard energy policy as too important to their own economic development and thus have to proceed at a pace each state is comfortable with. In Europe, nationalized industries have, for the most part, provided stability in the energy market. Because of their dominant positions, they have been viewed as essential industries by some of their respective governments. The EU's imposition of the Energy Directives threatened to change the

⁵⁵ "Green Paper, A European Strategy for Sustainable, Competitive and Secure Energy," European Commission, Brussels, March 8, 2006; "An Energy Policy for Europe," *Op. Cit.*

⁵⁶ See Directives 2003/54/EC and 2003/55/EC of the European Parliament and Council 2003, European Commission website [<http://www.eurunion.org>].

secure position many of these industries had enjoyed. In reaction, some national governments have taken measures to try to protect their industries, even while subscribing to the theory of open market competition.⁵⁷

This problem was highlighted in November 2005 when Energy Commissioner Piebalgs stated that “cross-border competition is not sufficiently developed... [due to] the failure of member states to implement the Directives on time or with sufficient determination.”⁵⁸

Energy Interconnection. As a liberalized European energy market progresses, the issue of energy security for EU member states will likely turn to the internal market’s ability to deliver energy supplies to Europe’s citizens through the interconnection of pipelines and electricity grids and to provide infrastructure security and emergency supply.

The EU’s energy security strategy continues to focus on the need for increased gas and electricity interconnection between member states. In 2005, only about 10% of the currently installed electrical generation capacity of Europe could be delivered across national borders. The European power transmission grid is divided into seven regional “pools” which, according to the Commission, are only weakly connected. Cross-border energy exchanges have increased recently. For example, in July 2006, the French electricity sector purchased additional power from Germany to offset the demand in France brought on by a heat wave. Although there are examples of the system working, especially in regions such as the Nordic pool, many contend that Europe’s recent experiences with a wave of blackouts were caused by weak links in Europe’s power grids, poor coordination between national and regional power markets, insufficient generation capacity and the lack of electricity transmission capacity that limits the exchange of power among member states. Interconnections between grids increase grid and distribution reliability. As such, a priority for the EU will continue to be to encourage investors to support the construction of more commercially competitive interconnections in order to create an integrated electricity market with cross-border electricity exchange. The EU will also promote greater interconnection between Europe’s existing gas, oil, and new LNG pipeline systems.

With Bulgaria and Romania having entered the Union in January 2007 and other nations in the Balkans region anticipating membership, the Commission has seen a need to extend the concept of a single electricity and gas market to Southeast Europe. A treaty establishing the Energy Community was signed in October 2005. This Treaty aims to extend the EU internal energy market to the South East Europe region. The main goals are to create a stable regulatory market framework capable of attracting investment; to improve the environmental situation and to develop electricity and gas market competition on a broader geographical scale. It is also intended to help stabilize a region through which new sources of energy are likely to transit.

⁵⁷ For additional information see CRS Report RS22468, *Europe: Rising Economic Nationalism?*, by Raymond J. Ahearn.

⁵⁸ “Energy: Member States Must Do More,” Press statement of Commissioner Piebalgs, Nov. 15, 2005.

Storage. Another important dimension in the strategy to provide energy security will be Europe's ability to react to the loss of energy supply either through a short-term disruption caused, for instance, by a technical failure, or an act of terrorism, or to a longer-term disruption caused by an economic or political event in either a producer or transit nation. In either case, the EU's energy security strategy could focus on the adequacy of energy storage capacity and the ability to share that stored energy in times of emergency. Europe has a strategic petroleum reserve, which was activated in anticipation of possible oil shortages when Hurricane Katrina hit the United States. On the other hand, there is no such reserve for natural gas. There are over 100 gas storage facilities identified throughout Europe and while some EU member states are serious about maintaining strategic storage for gas, others maintain partially filled reserves depending on projected seasonal demand. The EU is working to find a way to oblige owners of storage facilities to meet a minimum level of emergency supply.

A major issue with the storage requirement is access. Many nations consider energy storage facilities as security assets and are reluctant to open them to other member states in times of emergency. The Commission believes this issue of 'solidarity' is critical to the overall energy security of all member states and has insisted that available supplies be shared within the Union when needed. Any future EU-led energy security strategy would have to include a minimum level of oil and gas stocks to meet any type of disruption, an agreed upon plan for member state contributions to the storage requirements and an emergency withdrawal and distribution scheme.

TEN-E Program. Stronger linkage of power transmission from a variety of energy sources would represent a significant advancement of Europe's energy security. The mechanism the EU uses to promote gas and electricity interconnection between EU member states is known as the Trans-European Energy Network (Ten-E). The Ten-E framework accomplishes two objectives. First, it promotes increased coordination and exchange of information between member states on energy supply and demand. Second, it identifies and supports projects that will boost cross-border gas and electricity connections. Currently, 42 projects with cross-border transmission goals have been proposed for funding through the Ten-E budget and other sources such as the European Investment Bank. The EU expects to spend around 25 million euro on projects such as a France-Belgium, a Poland-Lithuania and Poland-Germany electricity connection. They also support an undersea cable connecting the UK with the Netherlands and an Italy-Slovenia connection. Ten-E has also helped promote the North European Pipeline (Norway-Denmark-Sweden) and the Medgas pipeline (Algeria-Spain-France) as priority projects.

As stated in the recent Commission proposals, while progress has been made, the internal European market for electricity and gas is not complete. Despite the continued apprehensions among some member states and the numerous obstacles yet to be overcome, the Commission contends that by increasing competition, a more open energy market will diversify supply, thereby mitigating the effects of individual dependencies and bolstering EU-wide energy security. Indeed, analysts contend that open markets and competition can guarantee a certain level of security if competitive forces are successful in providing energy from a variety of sources. In a 2004 paper, Giacomo Luciani, referring to the European gas market, suggests that as long as only

two sources of energy (Russia and Algeria) continue to dominate gas imports to Europe, it is unlikely that real competition can exist, and that increasing dependence on established suppliers is incompatible with competition.⁵⁹ Nevertheless, the idea of an internal market has been around for a long time and the Commission continues to advocate its completion as a policy priority.

Assessment

Most EU member states have long held that energy policy should remain the primary responsibility of the states themselves. However, Europe's growing reliance on imported, especially Russian, energy supplies coupled with recent Russian manipulation of energy flows to Ukraine, Moldova and Belarus have forced European countries not only to re-think energy as an element of individual national security but as an element of the EU's Common Foreign and Security Policy (CFSP). As such, more European member states appear to support the Commission's view that enhanced energy policy cooperation is sensible and can be achieved without surrendering total control to EU institutions. In 2006, the EU member states agreed in principle to pursue options toward creating a common energy policy for Europe and endorsed the principles of the Commission's Green Paper. Although member states are not due to entertain the Commission's more specific January 2007 recommendations until March 2007, events surrounding Russia's recent oil dispute with Belarus and a growing European consensus regarding the need to reduce carbon emissions indicate that European leaders may endorse further integration.

Some skeptics doubt the ability of EU member states to ultimately come to agreement on a host of energy-related issues. Open and competitive energy markets are desired, but protection of national energy industries still prevails in several key nations, including Germany, France and Spain. Some countries that have reluctantly agreed to open their energy sectors to more competition appear unenthusiastic about turning regulatory decisions over to Commission bureaucrats in Brussels. Finally, there is still disagreement on how to deal with Russia and on an appropriate diversification strategy.

In its January 2007 proposals for a European energy policy, the European Commission recommends an array of actions to increase energy security, sustainability, and competition in Europe's energy sector. Despite likely objections to individual aspects of the proposals, particularly with regard to Europe's internal energy market, the use of nuclear energy, and relations with Russia, it appears that energy security will continue to become more of a shared responsibility. In terms of increasing competition in the internal market, experts predict that member states will look to endorse a compromise proposal allowing the continued operation of national energy industries but subjecting them to oversight from an independent regulatory body that would also oversee the operation of electricity and gas flows, the pricing of energy, and the development and operation of LNG facilities.

⁵⁹ Giacomo Luciani, "Security of Supply for Natural Gas Markets," Indes Working Paper, Center for European Policy Studies, March 2004.

The EU appears likely to increase its role in coordinating and financing the development of renewable energy and the storage and use of emergency energy supplies. Although member states and their energy industries appear likely to retain absolute authority in determining which energy mix makes the most sense for individual countries, the EU stands to play a larger role in determining power grid interconnection arrangements and energy infrastructure investment levels. Finally, most of the decisions regarding supply sources and contract terms will likely remain the competence of the member states and their energy sectors.

Energy policy is also becoming an increasingly important element of the EU's Common Foreign and Security Policy. Enhanced energy dialogues with Russia and other energy producing and transit regions are being pursued in a more open and coordinated manner between the Office of the High Representative and the individual member states, and the Commission has outlined specific foreign policy goals with regards to multilateral treaties and an expansion of the EU's Neighborhood Policy. Nonetheless, foreign policy continues, first and foremost, to be determined by national governments. The outcome of EU efforts to reach consensus on a renewed partnership agreement with Russia during the first half of 2007 should provide a useful indication of the prospects for future energy and foreign policy integration.

Energy Security In The Transatlantic Context

Over the past 55 years, relations between the United States and the EU have steadily broadened and deepened so that today, they remain inextricably linked. Nowhere has transatlantic integration manifested itself more than in the economic relationship between the United States and the European Union. This economic partnership has been described by many as the single most important influence on worldwide economic growth, prosperity and trade.⁶⁰ Within the deepening transatlantic economic relationship, energy security policy is becoming a higher priority for both the United States and the European Union. Together, the United States and the European Union represent the world's largest energy market. The United States and the EU produce approximately 23% of the world's energy and combine for almost 40% of the world consumption of energy. The United States' share of global oil consumption is approximately 43%, while the EU consumes 18%. The United States consumes 23% of the world's production of natural gas. The EU consumes close to 19%. Combined, the United States and the EU represent over 40% of the electricity consumed world-wide and produce almost 40% of the global CO2 emissions.⁶¹

This is a critical period for the transatlantic partnership. The long-term implications of the energy debates taking place within the United States and Europe are so similar in scope that the United States and the European Union have found

⁶⁰ For a more detailed explanation of the economic relationship see "Deep Integration: How Transatlantic Markets are Leading Globalization," Hamilton and Quinlan, Johns Hopkins University School of Advanced International Studies, 2004.

⁶¹ See *BP Statistical Review, Op. Cit.*

common cause to join together in a cooperative transatlantic energy dialogue, not only to promote competitive markets and market-based policies of producing nations, but more importantly, to develop common strategies to ensure mutual supply security.

At the June 2006 U.S.-EU Summit in Vienna, Austria, the United States and the EU agreed to cooperate to improve energy security by “enhancing the dialogue with the main transit, producer and consumer countries and by promoting diversification of energy sources and supply routes worldwide, notably in the Caspian sea region, Middle East, and continental Africa...”⁶² Additionally, during the 109th Congress, Senator Lugar introduced the Energy Diplomacy and Security Act (S. 2435), calling for enhanced global energy security cooperation through the development of international energy partnerships.

Members of the Democratic Leadership in the 110th Congress have signaled their intention to introduce legislation aimed at increasing energy independence and reducing carbon emissions. In the face of enhanced congressional interest, European Commission calls for new international emissions targets, and increased coordination among energy producing nations, transatlantic collaboration in these areas stands to grow.

The United States-EU energy partnership is currently pursued at the multilateral level through organizations such as the International Energy Agency, the G-8, and the Bonn Renewables 2004 Action Plan. At the bilateral level, the United States has 35 energy agreements with 11 nations of Europe and seven formal agreements with the European Commission. Most of these agreements address nuclear and renewable energy or energy efficiency programs, such as the Energy Star agreement for the promotion of energy efficient office equipment. The United States and the EU are also engaged in a formal Bio-Fuels Dialogue and a Dialogue on Climate Change, Clean Energy and Sustainable Development.

At the same time, of particular concern to the United States is a potential long-term threat to transatlantic relations arising from European dependence on Russian energy supplies and Gazprom’s growing influence in large segments of Europe’s energy infrastructure. Mindful of the EU’s rising dependence on Russian energy, the United States and the EU have joined together to better understand at what point reliance on Russia could threaten Europe’s overall energy security and weaken the EU’s ability to deal with Russia on non-energy related policy issues. In particular, some U.S. analysts have expressed concern regarding a perceived EU reluctance to take concerted action to prevent Moscow from further exploiting its energy wealth as a policy tool for intimidation or coercion. Critics of EU policy toward Russia contend that the EU should strengthen its resolve in requiring Russia to ratify the Energy Charter Treaty and to accept standard open market business practices, competition and foreign investment in its energy sector. Observers on both sides of

⁶² 2006 Vienna Summit Declaration, issued by the United States government and the European Union, June 21, 2006. For additional information see the websites of the White House and European Commission; Conclusions of the US-EU Summit Declaration, June 21, 2006.

the Atlantic expect these issues to play a key role in negotiations on an EU-Russia partnership agreement during the first half of 2007.

Finally, transatlantic cooperation on energy security is not limited to efforts to promote energy efficiency, the use of alternative fuels or the securing of reliable supplies of energy from a diversified array of energy producers.

Discussion of supply security also includes issues surrounding energy crisis management and infrastructure protection. In this regard, some have called for NATO involvement in energy security issues, including in securing supply sources, distribution routes, and storage facilities. In 2006, Poland circulated a proposal for a so-called "Energy NATO," calling on an increased role for NATO in guaranteeing the protection of member state energy supplies. In a similar vein, in an address at NATO's November 2006 Summit in Riga, Latvia, Senator Lugar proposed the extension of NATO's collective defense clause, Article 5, to cases where a member state's energy security is threatened. Other EU member states, notably Germany and France, have greeted such proposals skeptically, preferring to advocate an enhanced EU role in energy security matters.

However, still others assert that NATO's role in energy security could be complementary to the EU's effort to strengthen market forces and interdependence in the international energy sector by offering assistance for the protection of pipelines or sea lanes during times of political unrest or conflict. Partnership for Peace countries, such as Kazakhstan and Turkmenistan, which are important energy producers are seeking ways to associate themselves more closely with NATO, in part to diminish Russian influence and in part to develop reliable partners in an unstable region. For some, NATO has the ability to help secure the energy infrastructure of such countries.⁶³

⁶³ For additional information see CRS Report RS22409, *NATO and Energy Security*, by Paul Gallis.